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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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David Silverstein Andover-IP-Law Suite 300 44 Park Street, Andover, MA 01810			EXAMINER WILSON, MICHAEL H	
			ART UNIT 1794	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/540,809

Applicant(s)

KATHIRGAMANATHAN ET AL.

Examiner

MICHAEL WILSON

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 64-74 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 64-74 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office action is in response to Applicant's amendment filed 17 November, 2008, which cancels claims 37-63 and adds claims 64-74.

Claims 64-74 are pending.

2. All previous rejections under 35 U.S.C. 112, second paragraph, 102(b), and 103(a) are moot due to applicants canceling the claims in the reply filed 17 November, 2008.

3. The objection to the drawing is withdrawn due to applicants amending of the drawings.

4. The objection to the specification is withdrawn due to applicants amending of the specification.

Claim Objections

5. Claim 68 is objected to under 37 CFR 1.75(c) as being in improper form because it depends from cancelled claim. See MPEP § 608.01(n). For the purpose of this Office action claim 68 has been treated as if depending from claim 67.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 64, 66-69, 71, 73, and 74 are rejected under 35 U.S.C. 102(b) as being anticipated by Thompson et al. (US 6,210,814 B1).

Regarding claim 64, Thompson et al. disclose an electroluminescent device comprising a pair of electrodes (column 13, lines 2-6) and an electroluminescent composition between the electrodes consisting essentially of a mixture of a metal quinolate and a dopant (column 5, lines 3-20 and column 6, lines 35-48). The dopant is disclosed as 1 to 10% by mass of the light-emitting layer (column 16, line 13). While % mass is not % mole, the range of 1 to 10% by mass would necessarily overlap with the range of 10^{-3} to 10% by mole. The reference also discloses metal quinolates as host material (column 5, lines 1-20 and column, 21 lines 47-65) and also discloses zirconium quinolate and hafnium quinolate (column 22, lines 41-45). While the reference is silent regarding "wherein said device has the characteristics of a higher luminance efficiency measurable as cd A^{-1} , a greater luminance measurable as cdm^2 at 20 mA cm^{-2} , and a reduced turn-on voltage compared with a similar device in which said metal quinolate is aluminum quinolate," those limitations would be inherent to the device. Therefore since zirconium quinolate and hafnium quinolate disclosed by Thompson et al. being within the formula claimed by applicant, the luminance and turn-on voltage of the device would

be expected inherently to have the same properties as disclosed by applicant. Recitation of a newly disclosed property does not distinguish over a reference disclosure of the article or composition claims. *General Electric v. Jewe Incandescent Lamp Co.*, 67 USPQ 155. *Titanium Metal Corp. v. Banner*, 227 USPQ 773. Applicant bears responsibility for proving that reference composition does not possess the characteristics recited in the claims. In *re Fritzgerald*, 205 USPQ 597, In *re Best*, 195 USPQ 430.

While it is recognized that the phrase "consisting essentially of" narrows the scope of the claims to the specified materials and those which do not materially affect the basic and novel characteristics of the claimed invention, absent a clear indication of what the basic and novel characteristics are, "consisting essentially of" is construed as equivalent to "comprising". Further, the burden is on the applicant to show that the additional ingredients in the prior art, i.e. a polar dopant, would in fact be excluded from the claims and that such ingredients would materially change the characteristics of the applicant's invention, See MPEP 2111.03.

Regarding claims 66-69 and 71, Thompson et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the device further comprises a hole transport layer between the anode and the light-emitting layer (column 12, lines 9-10 and 33-34) and an electron transport layer between the cathode and the light-emitting layer (column 12, lines 11-12, and 33-34). The reference also discloses the hole transporting material as TPD or α -NPD (instant α -NPB), which are aromatic

amines (column 13, lines 20-25). The electron transport material is disclosed as Alq, a metal quinolate (column 13, lines 25-27).

Regarding claim 73, Thompson et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the first electrode is a transparent electricity conducting glass electrode (column 13, lines 1-5). While the anode is ITO deposited on a glass substrate, one of ordinary skill would readily recognize and consider the ITO/glass as a glass anode.

Regarding claim 74, Thompson et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the second electrode is selected from aluminum, calcium, lithium, magnesium and alloys thereof, and silver/magnesium alloys (column 13, lines 33-36).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 65 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al. (US 6,210,814 B1) as applied to claim 64 above and in view of Hirai et al. (US 2001/0028962 A1).

Regarding claim 65, Thompson et al. disclose all the claim limitations as set forth above. Additionally, the reference discloses wherein the dopant may be DCM1, DCM2, or other suitable dopant molecules known to one of ordinary skill in the art (column 6, lines 37-40).

Hirai et al. teach perylene and acridine compounds as suitable light emitting compounds for an electroluminescent device [0039].

It would be obvious to one of ordinary skill in the art at the time of the invention to use perylene or an acrylene compound, such as a diphenylacridine, in the device of Thompson et al. given the teachings of Hirai et al. that such compounds are suitable light emitting compounds for an electroluminescent device. Both references teach similar electroluminescent devices. One of ordinary would further be guided in the selection of a specific compound by the desired color-emission of the device.

Case law holds that the selection of a known material based on its suitability for its intended use supports prima facie obviousness. *Sinclair & Carroll Co vs. Interchemical Corp.*, 325 US 327, 65 USPQ 297 (1045).

11. Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al. (US 6,210,814 B1) as applied to claim 66 above and in view of Kido et al. (US 6,396,209 B1).

Regarding claim 70, Thompson et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the electron transport material is a metal quinolate, Alq, (column 13, lines 25-27). However the reference does not explicitly disclose wherein the electron transport layer comprises lithium quinolate (Liq).

Kido et al. teach a similar organic electroluminescent device (abstract). The reference teaches using Liq with Alq in an electron injection layer (column 9, lines 59-65). While the reference calls the layer an electron injection layer, it is disclosed as the only layer between the cathode and the light-emitting layer and must inherently perform the function of an electron transport layer, transporting electrons, in order for the device to operate. Therefore the electron injection layer of Kido et al. can also be considered an electron transport layer. The reference teaches using the Liq in the electron injection layer (instant electron transport layer) reduce the barrier to electron injection from the cathode and ensures a low drive voltage for the device (column 2, lines 49-54).

It would be obvious to one of ordinary skill in the art at the time of the invention to use Liq, as taught by Kido et al., in the electron transport layer of Thompson et al. One of ordinary skill would reasonably expect such a combination to be suitable given that Kido et al. teach using Liq in an electron transporting layer with Alq in an organic electroluminescent device, and Thompson et al. teach Alq is suitable for the electron transport layer. One of ordinary skill would be motivated by a desire to reduce the

barrier to electron injection from the cathode and ensures a low drive voltage for the device.

12. Claim 72 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al. (US 6,210,814 B1).

Regarding claim 72, Thompson et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the electron transport material is a metal quinolate, Alq, (column 13, lines 25-27). However the reference does not explicitly disclose wherein the electron transport layer comprises zirconium quinolate.

However, Thompson et al. disclose that complex zirconium quinolate is electron transporting (column 21, lines 47-65 and column 2, lines 40-45) as suitable for use as the matrix material in the light-emitting layer. The reference also discloses Alq as electron transporting and suitable for the electron transport layer and as the matrix for the light-emitting layer (column 13, lines 25-27, and column 16, lines 12-15). Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to use zirconium quinolate in the electron transport layer of Thompson et al. given that Thompson et al. teach the complex as electron transporting and the reference demonstrates that a similar electron transporting quinolate suitable for the same purpose (matrix of the light-emitting layer) may also be used in the electron transport layer. Case law holds that the selection of a known material based on its suitability for its intended use supports *prima facie* obviousness. *Sinclair & Carroll Co vs. Interchemical Corp.*, 325 US 327, 65 USPQ 297 (1045).

Response to Arguments

13. Applicant's arguments filed 17 November, 2008 have been fully considered but they are not persuasive.

Applicant argues regarding Thompson et al. (US 6,210,814 B1) that the reference is principally directed to embodiments wherein aluminum quinolate is the host material and does not teach or suggest the benefits of zirconium quinolate as the host material. Applicant also argues that zirconium quinolate demonstrates unexpected improvements in performance characteristics.

However the examiner notes that preferred embodiments such as an example are not controlling. Rather, all disclosures "including unpreferred embodiments" must be considered. In re Lamberti 192 USPQ 278, 280 (CCPA 1976) citing In re Mills 176 USPQ 196 (CCPA 1972).

Further, with respect to the anticipation rejection of the claims using Thompson et al., as cited in MPEP 706.02(b), it is noted that a rejection based on 35 USC 102(b), can only be overcome by (a) persuasively arguing that the claims are patentably distinguishable from the prior art, or (b) amending the claims to patentably distinguish over the prior art. As can be seen, comparative data is not sufficient to overcome an anticipatory rejection under 102(b). It is also noted with respect to the data, the data would not be persuasive given that it is not commensurate in scope with the scope of the present claims given that there is no comparison of aluminum quinolate with

hafnium quinolate and further given that there is only data for one type and amount of dopant.

Additionally applicants argue that zirconium quinolate or hafnium quinolate together with an emissive dopant is substantially purely the color of the emissive dopant being used without a color contribution or distortion caused by the metal quinolate host material. By contrast, using aluminum quinolate in a similar electroluminescent composition causes noticeable dilution and/or distortion of the dopant color under excitation conditions. The present invention, applicants argue, is directed to minimizing emissive color distortions by minimizing the dipole moment of the electroluminescent composition. However the present claims include a dopant range which, according to the present specification, would include color contribution from the host material (page 3, lines 20-30), which would result in a change, or shift, in the resulting color emission of the device. Therefore it is clear that change in color emission is part of applicants' invention. Thus the polar dopant of Thompson et al. would not be excluded from the scope of the present claims that now recite "consisting essentially of" transitional language given that change on color emission is a basic and novel characteristic of applicants' invention.

Regarding arguments concerning Hirai et al. (US 2001/0028962 A1) applicants argues that Hirai et al. disclose a different type of light-emitting device that Thompson et al. and that the fluorescent compounds of Hirai et al. would exhibit different physical properties in the device if Thompson et al. However the reference clearly discloses perylene and acridine compounds as well as other fluorescent dopants as suitable for

the light-emitting layer [0039] of the light-emitting device [0025] which comprises a light-emitting layer between a pair of electrodes ([0027]-[0028]) instead of in the color-converting layer [0018]. Further applicant failed to present any evidence to support this position.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL WILSON whose telephone number is (571) 270-3882. The examiner can normally be reached on Monday-Thursday, 7:30-5:00PM EST, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MHW

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794